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tures and the migration of birds in general. Charles R. Keyes tells of the "Breeding of Harlan's Hawk in Iowa." Mr. Childs recounts some "Long Island Bird Notes for 1907." And the same author publishes extracts from an old manuscript consisting of "A Marvelous Collection of Unpublished Bird Songs." The one on the Bobolink, however, has long been a favorite selection for recitation. It was published in the *Century Magazine* about 1890. The Volume closes with a brief account of "The Childs' Library of North American Ornithology. We judge this to be now the finest private bird library extant.--J. G.

THE DEVELOPMENT OF NESTLING FEATHERS, by LYNDS JONES (=Laboratory Bulletin No. 13, Oberlin College; Oberlin, Ohio; 1907. [November]; pp. 1-18, pll. I-VIII [=142 figg.]).

According to Mr. Jones' statement the purpose of this paper is to 'give a more complete account of the development of down,' and to do away with any conception which may be held at present that the down is a structure distinct from the first definitive feather. While admitting that a continuity between the two has been recognized, he maintains that the down feather is not, as considered by most writers, a relatively separate and distinct feather, but is simply the distal end of the first definitive feather.

The first part of the paper is given over to a discussion of materials and methods. The author then goes on to trace the histological development of nestling down, which differs to some extent from that of the definitive feather. For example, the epitrichial layer of the skin forms the sheath of the down, but takes no part whatever in the formation of the first definitive feather. The development of the barbs and barbules in the down is essentially the same as in the first definite feather, tho as Mr. Jones points out the developing down fundamant has fewer ridges and a shorter diameter than the developing definite feather fundamant, and the down barbules are never provided with hooked barbicels. Further, he finds no chief ridges in the developing down, whereas in the definitive feather they mark the place where the shaft will later be developed. Barbules, however, are found on all down barbs except on certain spike-like feathers from the cuckoo. In the developing down feather the ridges extend from their proximal beginning the full length of the down, while in the definitive feather each ridge extends from its proximal insertion on the developing rhachis only a part of the way to the distal end of the feather germ. This is one of the main distinctions between the down and the definitive feather.

In the latter part of the article the relation of the down to the first definitive feather is taken up more in detail, and several series of cross-sections are figured to show the manner of

passing of the so-called down barb-vanes (the barb with its barbules) into the definitive barb-vanes. In most birds the down barb-vane passes directly into one or more definitive barb-vanes. Occasionally in the true down of certain altricial birds a "quill" is formed, but the author asserts that this is due more to reduced blood-supply and the drying influence of the air than to any innate tendency to form a true quill, and that it may often be split up if pressed between two hard surfaces.

Mr. Jones asserts that the first feather to appear in the ducks is made up of the true first down plus the first definitive feather. He thus very cleverly advances this instance as an example of the primitive relation between the down feather and the first definitive feather.

Altho the paper presents the facts of the case in a new light, it does not seem to a superficial observer that the proposition that the down is not a relatively separate feather is proved. The growth of the down and the succeeding definitive feather has always been considered to be continuous. Dr. Dwight, in speaking of down, says, "It is last seen as waving filaments at the apices of the feathers which succeed it." Mr. Jones in the present paper shows a large series of photographs of first definitive feathers bearing down filaments at their tips. Students of feathers have always recognized the fact that the down is borne directly at the end of the first definitive feather, and yet have considered the down a relatively separate feather. The down feather, and all the definitive feathers succeeding it, grow from the same papilla. Referring to the second crop of definitive feathers (the first winter plumage) Dr. Dwight remarks that a feather of the juvenal plumage may occasionally be found borne at the end of a feather of this dress! It would appear to be just as true, then, that morphologically the first definitive feather is the distal end of the second definitive feather as it is that the down is the distal end of the first definitive feather. The fact that the ecdysis may be discontinuous between the first and second definitive feathers alters the case morphologically not a whit.

In support of his point that the first feather of ducks represents a combination of the down and first definitive feather of other birds Mr. Jones says that its stages of development and growth cover the period commonly taken by the development of both the down and first feather in other birds. The question of time proves nothing, however. The conception as commonly held that the first feather is the *down*, and that the second feather is the first definitive, seems to be more in accordance with the facts. The first feather is modified as a covering for the young. In most birds no thick covering is necessary, but in ducks, which need such a covering a down feather with a shaft is developed. Again, why should the structure and development of Anserine first feathers be regarded as indicating the primitive structure and mode of differentiation of any typical first feather rather than the structure and development of, say Passerine first feathers? Both have in all probability diverged widely from the primitive common type, and now each is highly specialized to serve its own

purpose. Allowing, however, that the first feather of ducks is the first definitive feather plus the down, the relation between the first definitive and the second definitive is much clearer. In figures 90-96 Mr. Jones shows photographs of the second feather of ducks, which is the second definitive according to his assertion, bearing at its distal end the first feather, which he regards as the combined down and first definitive. We see then that the relation between the first and second definitive feathers is practically the same as that between the down feather and the first definitive. Yet these are all regarded as relatively separate feathers, and certainly deserve to be in the light of all known facts.

The paper is interesting as showing the mode of connection between the down barb-vanes and the definitive barb-vanes. It would be instructive for some future investigator to explain and figure in detail the connection between the first and second definitive feathers.—WALTER P. TAYLOR.

MINUTES OF COOPER CLUB MEETINGS

SOUTHERN DIVISION

MAY—The Southern Division of the Cooper Ornithological Club, met at Throop Polytechnic Institute, May 30, 1907. The first part of the evening was filled up with informal consideration of topics of interest, the meeting being called to order about nine o'clock, with President Morcom in the chair. Walter Taylor was selected as secretary *pro tempore*.

The name of Cyril H. Bretherton was proposed for membership by Mr. Grinnell for Mr. Law. Mr. Watson, who is about to leave for Denver, Colorado, handed in several names of possible members of the club.

As there was no more business to be considered the meeting adjourned, and for the rest of the evening general ornithology and projected summer outings were discussed.

Members Morcom, Howard, Chamberlain, Judson, Watson, Lamb, Taylor, Willett and Grinnell were present.

WALTER P. TAYLOR,
Secretary pro tem

AUGUST.—A specially called meeting of the Southern Division was held in the City Clerk's office, Los Angeles, August 30, 1907. President Morcom called the meeting to order at 8:30 P. M. with the following attendants: Dr. T. S. Palmer, J. H. Gaut, H. T. Clifton, O. W. Howard, G. Willett, G. F. Morcom, L. Chambers, Alphonse and Antonin Jay, C. E. Cosper, J. E. Law, J. Grinnell, H. J. Lelande.

The main interest of the evening was centered in the presence of Dr. T. S. Palmer, of the U. S. Department of Agriculture. Dr. Palmer spoke to the Club at length concerning the scope of work of the Bureau of Biological Survey, and especially of his own duties in connection with game preservation. He told very entertainingly of experiences in detecting illicit traffic in game, and of the institution and protection of National game refuges.

The matter was brought up of the establish-

ment of game preserves on our own coast. Several colonies of the Least Tern yet remain, and these deserve protection. It was thought that the readiest means would be thru efforts to induce private landowners to post and patrol their holdings.

Dr. Palmer was given a hearty vote of thanks for his cordial compliance with the invitation to talk to the Club, and the evening will long be remembered as one of the most enjoyable and profitable in the Club's history.

J. EUGENE LAW,
Secretary.

NOVEMBER.—The regular November meeting of the Southern Division was held in the offices of H. J. Lelande, City Hall, Los Angeles, Cal., Wednesday evening, Nov. 27, with members G. Frean Morcom, H. J. Lelande, Jos. Grinnell, H. T. Clifton, O. W. Howard, C. E. Cosper, Howard Wright, W. Chamberlain, Walter Taylor and J. E. Law present.

The minutes of the September meeting were read and approved, and Mr. Howard and Mr. Lelande, who were present at the October outing meeting, gave an oral report. They noted several additions to the list of Newhall, Cal., observations. This list will be published elsewhere. They also noted that the English Sparrow colony there is increasing.

Applications for membership were proposed: C. O. Esterly, Ph. D., and L. A. Test, Ph. D., both of Los Angeles, Cal., and both proposed by Prof. Loye Holmes Miller; and Robert B. Rockwell, 1322 E. 13th Ave., Denver, Colo., proposed by Joseph Grinnell. In accordance with the By-Laws, action on these was deferred till next meeting. On motion, duly carried, the secretary was instructed to cast the unanimous ballot of those present electing to active membership Cyril H. Bretherton and R. Magoon Barnes, the latter subject to the approval of the Club-at-large owing to his non-residence in the State.

Mr. Grinnell proposed a vote of thanks to Mr. Clifton, the retiring business manager of THE CONDOR, for the faithful service rendered the Cooper Club during the years he has handled its finances, and for his very efficient management of its business affairs, until now the Club, and with it THE CONDOR, is in a most thriving condition. The motion was heartily approved by all present.

This being the last regular meeting before the annual election, nominations for 1908 were called for resulting as follows: For President, G. Frean Morcom; Vice President, H. J. Lelande; Secretary, J. Eugene Law, Treasurer, W. Lee Chambers.

A paper by Mr. F. C. Willard, Tombstone, Arizona, on the bird life in the vicinity of Tombstone, was read by the secretary in the absence of the author. Mr. Willard records some interesting local notes, and finds bird life much localized, particularly about a few cottonwoods and other trees on the edge of the city. In this little clump no less than 28 pairs of birds representing ten species raised their broods in 1907. Adjourned.

J. EUGENE LAW,
Secretary.